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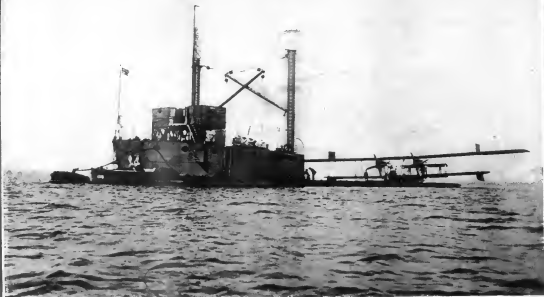
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AVIATION

NOVEMBER 13, 1922

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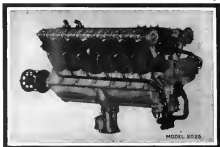
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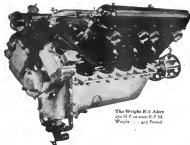
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NOVEMBER 15, 1922

AVIATION

VOL. XIII. NO. 20

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Vol. XIII

NOVEMBER 15, 1932

No. 29

The General Design of Commercial Aircraft

DESIGNERS of commercial aircraft will find much of interest in the N. A. C. A. report of the above title, by Prof. Edmund P. Warner, which is reprinted in the present issue. Professor Warner recently returned from an extensive tour of Europe in behalf of the American Aeronautical Engineering Society of M. E. T., which E. T. Allen presided at. He will be able to tell us much about the conditions in Europe in the line of aircraft design.

What Professor Warner has to say about the general look of attention designers of commercial aircraft display toward the passenger's comfort and convenience, applies with equal force to many of our own, so-called commercial airplanes. But in this country such shortcomings may be excused on the ground that we have relatively little experience with passenger-carrying airplanes, for such services as we have are only "semi-commercial" instead of operating all the year round. Lack of facilities has, furthermore, not justified the construction of specially designed commercial aircraft in America, particularly in view of the fact that large stocks of low-priced war machines, readily convertible for commercial uses, are still available.

In Europe on the other hand, their conditions do not obtain. There, regular passenger-carrying airplanes have been in existence ever since the summer of 1918, and they have been regularly making runs, bolstered up by heavy government subsidies. The converted war machines have by now been largely eliminated abroad, and newly designed purely commercial ships have come to be used. It is therefore astonishing to hear that some progress should not have been made in Europe with a view to attracting the traveling public to the airways by affording it a reasonable amount of comfort. Comfortable seats and ample leg room are of course the prerequisites of passenger comfort, but adequate ventilation without draft is a problem which it is just as important to solve, whatever the difficulty involved. Judging by actual experience, poor ventilation is by far the most unsatisfactory feature to be found in today's ocean liners, although large machines are as a rule better in this respect than small ones. Ventilation of the structure under the regimen of the power plant is another undesirable feature which designers would do well to study with a view to its elimination. In this connection it should be noted that this ventilation may be very strong at a cabin without even being noticeable to the pilot or the cockpit, and also that the ventilation of twin-engine ships is generally worse than that of single-engine ones.

It will be seen, that the above remarks merely concern the comfort and convenience of the passenger, and do not enter into the problem of commercial efficiency proper. We believe that American designers have a great opportunity to make improvements on present commercial aircraft designs. In order of importance we place the comfort of the passenger at the head of the list, believing that even the public feels that

it can travel by air as comfortably as by a locomotive, it will take to air travel as a matter of course, and so make the airways pay long before any theoretical improvement in pay load could bring about this result.

American Achievements in the Air

THE remarkable 2000-mile gas-stop flight made from San Diego, Calif., to Roberts Field, Kans., by Lieutenants John A. Macready and Oakley G. Kelly of the Air Service is but another proof of the growing supremacy American aviation has achieved in the last two years.

At the time of writing American aviators held the world's official maximum speed and altitude records and the unofficial world's distance and distance records—the four most coveted aeronautical honors. Lieutenant Macready's altitude record of 34,500 ft., made on Sept. 28, 1931, still stands unbroken. For example, William Mitchell, Assistant Chief of Air Service, holds the world's official maximum speed record with 224.45 m.p.h., which he made at Detroit Oct. 31. Lieutenants Macready and Kelly hold both the unofficial world's round the distance (25 hr. 18 min. 20 sec.) and the distance (2,000 miles)—both performance being far in excess of previous achievements.

All four performances were made by officers of the U. S. Army Air Service, which may feel justified pride at this well-deserved showing of professional skill by its members.

Considering the backward position the United States occupied in aircraft construction upon its entry in the Great War, and the wonderful strides this country has since made in aeronautic design, construction and operation, despite a financial crisis unexampled in contrast with that of European nations, we may be excused for feeling the thrill of justifiable pride. The Air Service pilots who gave the world a tangible proof of our growing ascendancy in aeronautics deserve well of the nation, and the nation their accomplishments bring upon the Air Service will be their greatest recompense.

The Maynard Benefit Meet

THE aviation meet to be held at Curtiss Field, Garden City, N. Y., on Nov. 18, next, to assist the needy family of the late Earl, Berta Maynard, is an event which should have the patronage of the entire aviation-minded community. The great fair that found an untimely and through circumstances foreign to her better judgment and flying skill, was a pioneer in every sense of the word. Her history in the Transcontinental Airplane Race of 1910 afforded a striking example of the value of careful preparation combined with grit and flying skill.

We can no better honor her memory than by attending the benefit performance organized in behalf of her widow and children.



Close-up of the floor of the Dornier—a clever arrangement showing strength and economy

is somewhat important in the vibration of the surface structure itself. This is probably the case in the Fokker, since the shearing of the Dornier covering against the steel tubular structure of the fuselage appears to be a major element in the sound.

Seating Arrangements

The seating arrangements on all the large airplanes are the same, individual chairs being placed on each side of the cabin, with an aisle between them. On the Fokker there are five aisles, centered by an aisle which runs almost along the pilot's position. The machine is ordinarily seated in this aisle, and has to reverse its seat and crew in partially under the pilot's seat whenever passengers wish to walk in and from.

In the smaller airplanes there is some diversity of arrangement. On the Dornier five passengers are carried, three of them riding inside the cabin in chairs facing forward, one in a similar chair facing backward, and the fifth in the cockpit "behind" the pilot, behind a windshield so constructed as to render goggles unnecessary. The arrangement of seats so that none or all of the passengers face toward the rear is undesirable, as it is likely to cause sea-sickness, and the absence of the fixed design can hardly be approved. Carrying passengers in the cockpit is also an expedient of doubtful wisdom. It seems safe to follow the practice adopted by the Dornier Co. and always to use the second seat in the cockpit for a reserve pilot capable of operating the controls in case the regular pilot is injured or becomes ill.

The Fokker, which also carries five passengers, employs quite a different scheme. Three passengers are seated side by side on a seat which runs across the back of the cabin, the other two occupying chairs a little farther forward and against the sides. This seems to be the best arrangement that has been produced for a five-passenger cabin.

The Potez has a four-passenger cabin, and the seats are in pairs. The cabin is not wide enough to leave an aisle between the seats, and one of the rear seats is directly against the door. The airplane is therefore loaded by removing the chairs and allowing the passengers to get in and then sliding the chairs in behind them. There is a small cross-aisle running across between the front and rear seats a little higher than a man's waist, and it is necessary for the forward passengers to duck under this to reach their places. It is a little too crowded for comfort in getting in, but there is plenty of room for the passengers after they are once installed.

The layout is considerably good in the cabin of all these airplanes. I am considerably above the average height, but I had no complaint to make against any of them in that respect.

The chairs are always fastened in place, of course, in a few instances, as in the rear seat of the Fokker and in one or two of the larger airplanes, they are unnecessarily secured, and in most cases they are held by a piece of shock-absorbing cord with a hook at each end, running from an eyebolt in the floor to one in the chair.

Surfly belts are provided only in the Dornier. They promise much in no service. They are useless unless they are used all the time, and an ordinary passenger will not strap himself in except after a lecture on the dangers of accident when his only real effect is to shackle the trip altogether. The best logical effect of the belt is, and there should be no one seriously for it inside of a closed cabin. It is better to fasten the chairs down and to make their seats of such form that it is easy to hold on in case of a rough landing.

Cabin Doors

Doors are provided in all the airplanes save in several commercial ones, on one side only. They are satisfactorily placed in most cases, the Potez being the most cramped for entry and exit, which is natural, as it is the smallest airplane in use. In several of the airplanes under consideration a swinging of an emergency door is slight without shaking from outside, but that situation is always available except in case of a forced landing. None of the doors are high enough to enter without stooping, but it is not really necessary for they should be, and I think, on the whole, that the present situation in this respect does not require improvement.

One feature which has been given some attention is a possibility of a door's being opened or sprung open in flight and allowing a passenger to fall out. No such incident has ever happened, but it seems wise to make definite provision against it. On the Fokker a steel bar is lowered across the door and locked in place, so that the weight of a passenger leaning out of the window falls on the bar and not on the door itself. Unfortunately, I may remark that such provision is little used unless they are used, and that on my flight from Brussels to Amsterdam the machine who closed the door in flight to leave the bar. Provision against the opening of the door is also made in the Gullitt, considerably in the shape of another and, by the removal of a fuselage band was across the door. The rear has a quick detachable ring of the lowermost handle type at one end, and it can thereby be disconnected and removed while the passengers are going in and out, being replaced before going into the air.

The storage of baggage is a problem of considerable importance, especially in view of the number of



Interior view of the cabin of the Fokker P.III passenger carrier



Fokker P.III 3-passenger cabin monoplane which is extensively used on the Dutch and German airmails

weight who are coming from England, to the Continent for war and who want to take with them everything that they own. The success of this business is much larger at Brussels than it would be likely to be in America, as the rates for international express baggage in Europe are fantastically high. A voyage by air from Paris to London actually finds it cheaper to take baggage with him on the airplane than it would be by express, in my opinion, of the fact that the express rates are about a week for two hundred and thirty miles. When I last asked to England by Handley-Page I took with me on the airplane more than two hundred pounds of books and documents obtained in the Continent, and paying express baggage on them by air actually was the cheaper method of transporting them.

Handling Baggage

There are three general methods of handling baggage. It may be sent along in another airplane especially fitted for the purpose, it may be stacked in the cabin, or it may be carried in a baggage compartment not directly connected with the cabin. The first method has been little used as yet, although one of the London-Paris lines has recently put on a special baggage and express service by airplane without even the whole cabin being filled with express matter, and an American tourist well-known in aeronautical affairs in this country recently hired two airplanes, one for his family and another for his trunk, to take him across the Channel.

The second method, that of carrying the baggage in the cabin, is generally used on the French airplanes. It would be very undesirable were it not that the French lines are running as a rule with a very few passengers at full load, thereby leaving to the great convenience of their sailors, and there is rarely a large place of space room for the baggage, which is simply stacked between chairs and in the seats. Trunks, however, cannot be handled in this way. To give an indication of the conditions existing on the French lines on the Continent and the amount of space available and unused inside the cabin I have tabulated my own experiences below:

| Route | Airplane | No. seats | No. passengers | % seats unused |
|--------------------|--------------|-----------|----------------|----------------|
| London-Paris | Dornier | 5 | 3 | 33 |
| Paris-Rouen | Fokker | 12 | 2 | 17 |
| Brussels-Amsterdam | Fokker | 5 | 3 | 33 |
| Paris-Visnua | Potez | 4 | 1 | 25 |
| Paris-Brussels | Potez | 4 | 1 | 25 |
| Paris-Brussels | Potez | 5 | 1 | 20 |
| Brussels-Paris | Potez | 5 | 1 | 20 |
| Paris-London | Handley-Page | 19 | 6 | 68 |

The French companies on the London-Paris route are doing better than those on the Continent, although not so well as the others on the English coast.

The carrying of baggage in the cabin can only be considered a temporary makeshift, and the only real solution is

the use of a special compartment, such as it provided on the DH-34 and on the Handley-Page. In the DH-34 the baggage compartment is behind the cabin, thus being far from the center of gravity of the airplane, and the danger weight of baggage is likely to interfere with balance in flight. When I flew on that airplane the weight of baggage was unusually heavy, and we had been off the ground only a few minutes when the pilot reported that the forward passengers should take seats as far forward as possible and that the rear seats should be the rearward ones. On the Handley the likelihood of such difficulty is reduced by the provision of two compartments, one behind the cabin and the other in front, below the pilot in the very deep fuselage. The weight in the rear compartment can then be kept substantially constant. Two compartments and the door leading to them are large enough to admit a good-sized trunk.

Interior Arrangement of Cabins

The interior decoration schemes on the transport airplanes actually in use are much simpler than were those shown in the last two issues, and the design is, as a whole, for the better. Last curtains and similar ornaments were not only unnecessary but positively dangerous, owing to their inflammability. The most elaborate finish of the airplanes now in actual use in the Fokker, closely followed by the English airplanes, all of these having varnished floors and cloth-covered or clean-painted walls and ceiling, and an evident effort being made to keep the interior as neat as possible without, however, it is to be made simple. The interior of the three French airplanes used are very plain, being finished simply in brown or yellow paint.

The subject of interior arrangement naturally involves any arrangements made for the information and direction of the passengers. The French lines make no such arrangements. On all the airplanes except the French ones, there are notices posted in the cabin for the purpose of instructing and advising the passengers of their privileges and the first time the error productions of smoking and of throwing anything out of the windows (as the Gullitt there was no prohibition of smoking) and the machine passed cigarettes around to the passengers, and sometimes information to the effect that the luggage that will be left unattended is stored in the cabin and do not represent any danger, the airplanes being inherently stable (there may be some question as to how many of the passengers know what "inherently stable" means). They further add, in the two larger airplanes, the information that passengers can move about freely and change seats while in the air, the slight redistribution of weight having no effect on the aircraft. This is very wise, as the carrier in air travel often seems to have that he is in a vehicle more truly than a canoe, and also storing himself in front of him with every muscle strained throughout the journey. The notice in the Handley goes on specifically to advise the passengers to relax and take it easy, while the Fokker notice, printed in three

Aeronautical Map of Italy

Recognizing the need of an aeronautical map of the Kingdom, that will offer information and exact reference to aerial navigation, the Ministry of Marine has decided to call a competition for the edition of an aeronautical map of Italy open to Italian citizens only.

The following prizes have been assigned:

- 1st prize—Lire 30,000
2nd — ——Lire 15,000
3rd — ——Lire 5,000

The contestants will have to present the original or the lithographic production of one sheet of the future aeronautical map of Italy and precisely the one composed between 8° and 8° of longitude East Greenwich, 45° and 56° of northern latitude.

The jury will consist of: the Director of the Geographical Military Institute, a delegate of the Hydrographic Institute of the Royal Navy, a representative of the Aeronautical Department of the Royal Navy, and an authorized member of the National Sport Association.

The works which will be awarded prizes will be used for the edition of the aeronautical map of Italy, with the necessary changes and additions as required.

Long Cross Country Flight

Probably the oldest aviator in the world, Col. C. C. Dickinson of Chicago, 62 years old and a pilot, left Washington on Nov. 11 en route for Chicago on the last leg of a remarkable flight. The Colonel, an ex-Louis "Goliath" aerial handballer, flew from Chicago to the next station west at Detroit and, following the Pulitzer Trophy race, topped off



Captain C. C. Dickinson flying biplane equipped with complete set of flying light instruments.

for a trip to Florida, stopping over one day on the return to visit the national headquarters of the National Aeronautic Association in Washington, D. C.

Colonel Dickinson, then 50 years of age, was taught to fly in 1910 by the famous British pilot, Claude Grahame-White, who visited this country for the Gordon Bennett airplane race of that year. Since that time the Colonel has been an aeronautical enthusiast and a supporter of the progress of aeronautical aviation in this country. He took an important part in the deliberations of the Duxford Aero Committee, and was a much interested observer of the Pulitzer Race.

On reaching Chicago Colonel Dickinson will have completed an aerial tour of 2,500 miles which, for a man of his age, might seem remarkable, but the Colonel considers it nothing unusual in view of the proved reliability of American aircraft, and the comfort of traveling by air.

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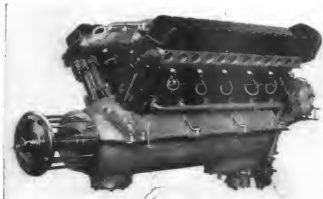
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